

10/511345  
DT04 Rec'd PCT/PTO 15 OCT 2004

**IN THE CLAIMS:**

Please amend claims set forth below.

1. (Currently amended) A method for producing canthaxanthin, comprising the steps of:

inducing a mutation in a parent astaxanthin-producing ~~microorganisms~~ in which the ~~nucleotide~~ micro-organism strain, wherein the DNA sequence of DNA corresponding to its that corresponds to the micro-organism's 16S ribosomal RNA is substantially homologous to the ~~nucleotide~~ sequence as shown in SEQ ID NO:1; ~~obtaining~~ canthaxanthin-producing microorganisms by selecting a mutant having that produces a higher ~~ratio~~ mass percentage of canthaxanthin produced (% by mass) relative to the amount of carotenoid produced than that of a produced by the parent strain of the micro-organism; and recovering canthaxanthin or a carotenoid mixture comprising canthaxanthin from ~~the a~~ culture product of the ~~canthaxanthin-producing microorganisms~~; selected mutant micro-organism.

2. (Currently amended) The method ~~according to~~ of claim 1, wherein the ~~ratio~~ mass percentage of canthaxanthin produced ~~from the canthaxanthin-producing microorganisms~~ is at least 40% by mass relative to the total amount of carotenoid produced.

3. (Currently amended) The method ~~according to~~ of claim 1, wherein each of the ratios of ~~b~~  $\beta$ -cryptoxanthin, zeaxanthin, 3-hydroxyechinenone, asteroideone, adonirubin, adonixanthin, and astaxanthin produced from the ~~canthaxanthin-producing~~ selected mutant microorganisms micro-organism is less than 20% by mass relative to the total amount of carotenoid produced.

4. (Currently amended) The method of claim 1 ~~according to any one of claims 1 to 3~~, wherein the astaxanthin-producing ~~microorganisms~~ micro-organism ~~is~~ are selected from the group consisting of: E-396 strain known as (FERM BP-4283); ~~a and a mutant thereof~~, of the E-396 strain known as FERM BP-4283; ~~and the A-581-1 strain known as~~ (FERM BP-4671); ~~and a mutant thereof~~ of the A-581-1 strain known as FERM BP-4671.

5. (New) The method of claim 2, wherein the astaxanthin-producing micro-organism is selected from the group consisting of: the E-396 strain known as FERM BP-4283; a mutant of the E-396 strain known as FERM BP-4283; the A-581-1 strain known as FERM BP-4671; and a mutant of the A-581-1 strain known as FERM BP-4671.

6. (New) The method of claim 3, wherein the astaxanthin-producing micro-organism is selected from the group consisting of: the E-396 strain known as FERM BP-4283; a mutant of the E-396 strain known as FERM BP-4283; the A-581-1 strain known as FERM BP-4671; and a mutant of the A-581-1 strain known as FERM BP-4671.